

ABSTRACT

The present invention provides a new multiple access scheme, called the spread space spectrum multiple access scheme (SSSMA), designed for the forward link in a wireless multi-antenna system serving multiple users, who may have different quality of service requirements such as data rate and error probability. In the multi-antenna system where the SSSMA is employed, the base station transmitter and the receivers at the users' terminals all employ multiple antenna elements. By exploiting the multiple antennas which are deployed at the base station and each user's terminal, the objectives of the SSSMA are two folds: (1) increase the number of user-channels available in the system, (2) increase the individual user's data rate and improve the link performance such that each user's service requirement is satisfied. The invention comprises a modulation scheme that is more generally applicable to a system where a transmitter that is fixed, portable, or even under motion, and is usually referred to as a base station, or access point, transmits a number of information bearing signals simultaneously to a number of terminals in different remote locations that may be fixed or mobile. Such a transmission system is normally referred to as a point-to-multipoint transmission system